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APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO
09,352,976	07/14/1999	MICHAEL D. GILBERT	00169-027001	2851

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EXAMINER

CHANG, VICTOR S

ART UNIT	PAPER NUMBER
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1771

DATE MAILED: 02/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09-352,976

Examiner

Victor S Chang

Applicant(s)

GILBERT, MICHAEL D.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 a) and b) and, however, may a reply be timely filed after Six (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire Six (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-38, 40, 41 and 44-65 is/are pending in the application.
- 4a) Of the above claim(s) 33 and 44-59 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32, 34-38, 40, 41 and 60-65 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9, 12.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Rejections not maintained are withdrawn.

#### ***Claim Rejections - 35 USC § 112***

3. Claims 1-32, 34-38, 40, 41 and 60-65 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. A disclosed genus of polymeric electrode compositions having ionic conductivities in the range of  $10^{-11}$  to  $10^{-5}$  S/cm at room temperature and certain range of shear strength are considered critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

More particularly, it is noted that the independent claims 1, 30 and 34, in their present state, give no notice as to what compositions might infringe the claimed "composition". Each of the independent claims, as now reads, states only that it is a "composition" having two vague "functionalities", or properties. The Examiner believes that the independent claims should state at the very least the polymers of the compositions, the ionic conductivities in the range of  $10^{-11}$  to  $10^{-5}$  S/cm at room temperature (Specification, page 12, first complete paragraph), and the range of suitable shear strength of 2000-4000 psi (Specification, page 5, 4<sup>th</sup> complete paragraph). The absence of such genus of polymer compositions, suitable ionic

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conductivities, and range of shear strength in the independent claims render the claimed invention in excess of its provided enablement, i.e., these functional recitations are too broad since it appears to read upon materials that could not possibly be used to accomplish purposes intended.

Additionally, in claim 27, line 2, the phrase "with a surface of at least 200 psi" is unduly broad.

In claim 30, line 5; claim 60, line 3; and claim 61, line 2, the phrase "greater than 200 psi" is also unduly broad.

4. Claims 1-32, 34-38, 40, 41 and 60-65 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It should be noted that claims merely setting forth physical characteristics desired in article, and not setting forth specific compositions which would meet such characteristics, are invalid as vague, indefinite, and functional since they cover any conceivable combination of ingredients either presently existing or which might be discovered in future and which would impart desired characteristics. As such, in the independent claims 1, 30 and 34, recitations such as "when said matrix functionality forms said adhesive bond to said electrically conductive surface, said composition can support a faradic reaction at said electrically conductive surface, said faradic reaction weakening said adhesive bond" is vague and indefinite since it purports to cover everything which will perform the desired functions regardless of its composition, and, in

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fact, recites compounds by what it is desired that they do rather than what they are. *Ex parte Slob* (PO BdApp) 157 USPQ 172.

In claim 62, line 2, the phrase "between the first and second material layers" is vague and indefinite, i.e., it is not clear to the Examiner the structural relations among the layers.

### ***Response to Amendment***

5. Claims 1-32, 34-38, 40, 41 and 60-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moulton et al. (US 5441830).

Moulton's invention is directed to methods for enhancing the adhesion of composite electrodes onto conductive plastic foils (Abstract).

For claims 1, 2, 4, 9-10, 17-20, 26, 28-32, 34-38, 40-41, 60-61 and 63-65, Moulton teaches that composite cathodes and composite anodes are well known in the art. Typically, the "composite electrode" contains a polymer which acts to bind the composite materials together and an electrolytic solvent. For example, a composite cathode can comprise a compatible cathodic material, a conductive material, an electrolytic solvent, an alkali salt, and a solid matrix forming polymer (column 8, lines 10-21). Curing or crosslinking is generally accomplished by conventional techniques to form a solid electrode (column 13, lines 29-38). Although Moulton does not expressly state the crosslinking density and mechanical strength in different regions, it is believed that these properties are inherent properties of composite electrodes. Regarding the delivering of crosslinking agent by means of zeolite, clay and polymer gels, the

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Examiner takes Official notice that the aforementioned delivering methods are old and well known. Further, since it is well known that an electrode layer is conventionally formed on a current collector, such as a metal foil, it is believed that adherence between an electrode and a current conductive surface is inherent. Additionally, it is believed that a faradic reaction at the interface weakens the adhesive bond is also <sup>an</sup>old and well known fact. Note also as evidence of the state of the art Koga (US 5565284) which teaches that charge-discharge cycles exacerbates the interfacial adhesion between the current collector and the electrode layer and lowers the discharge capacity of the electrodes (column 1, lines 39-52).

For claims 3, 11-12, 15-16, Moulton teaches that suitable cathode prepolymers are well known in the art and preferably are alkali or alkaline earth metal ion conducting, such as urethane acrylates, vinyl sulfonate polyalkylene oxides, etc. (column 12, lines 26-35).

For claims 5-8, 13-14, Moulton teaches that the cathode paste can optionally contain film forming agents which are well known in the art and include, polyethylene oxide, polypropylene oxide, copolymers thereof, and the like. having a numbered average molecular weight of at least about 100,000 (column 12, lines 36-44).

For claims 21-22, in Example 7, Moulton teaches that the cathode powder is prepared by combining 90.44 wt%  $V_5O_{13}$  [prepared by heating ammonium metavanadate ( $NH_4^+VO_3^-$ ) at 450°C for 16 hours under  $N_2$  flow] and 9.56 wt% of carbon powder (column 18, lines 57-61). Further, it is believed that anions such as perchlorate,

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hexafluorophosphate, etc., are commonly used to form the salts with alkaline or ammonium cations.

For claim 25, in Example 7, Moulton teaches that inhibitor is included in the preparation of cathode paste (column 19, line 32-33).

For claims 23 and 24, Moulton is silent about the conductivity of the composite electrode. However, it is believed that ionic conductivity is either inherently related to the amount of polymer matrix in the composite, or an obvious optimization to one skilled in the art. As such, it would have been obvious to one skilled in the art to optimize the amount of polymer matrix in the composite, motivated by the desire to improve the adhesion at the interface.

For claim 62, it is believed that incorporating additional electrically conductive element to further facilitate the faradic reaction at the interface to debond the adhesive is well within the skill of the art. Note also as evidence of the state of the art JP 11-134275 which teaches that additional layers of electrically conductive element can be included in the laminated structure (Fig. 2).

**6.** Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor S Chang whose telephone number is 703-605-4296. The examiner can normally be reached on 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel H Morris can be reached on 703-308-2414. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

VSC  
February 27, 2003

DANIEL ZIRKE  
PRIMARY EXAMINER  
GROUP 1900  
1709

*Daniel Zirke*